

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF JORG MULLER-ZILLER, ET AL.

FOR: ARRANGEMENT AND METHOD FOR TRANSPORTING METALLIC WORK  
PIECES, AND SYSTEM FOR HEAT TREATMENT OF SAID WORK PIECES

AMENDMENT

Commissioner of Patents and Trademarks  
Washington, DC 20231

Dear Sir:

Before examining the present application, please amend as follows:

IN THE SPECIFICATION:

Please delete page 13.

Please insert the following section title before the first paragraph on the first page:

--FIELD OF THE INVENTION--

Please insert the following section title before the second paragraph on the first  
page:

--DESCRIPTION OF THE RELATED ART--

Please insert the following section title before the last paragraph on the third page:

--SUMMARY OF THE INVENTION--

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Please insert the following section title before the first complete paragraph on page nine, that is, before the paragraph beginning, "Details and further advantages of the object \* \* \*":

--BRIEF DESCRIPTION OF THE DRAWINGS--

Please insert the following section title before the fifth complete paragraph on page nine, that is, before the paragraph beginning, "The arrangement for transporting metallic work pieces \* \* \*":

--DETAILED DESCRIPTION--

IN THE CLAIMS:

Please amend the following claims in "clean" format:

1. (Amended) An arrangement for transporting metallic work pieces, especially during a heat treatment process, comprising:
  - a heat-insulated transport chamber to hold the work pieces;
  - means for loading and unloading the work pieces; and
  - a transporting gear for moving the transport chamber,wherein the transport chamber can be moved horizontally, is designed to be vacuum-tight, and can be evacuated of air to create a vacuum to protect the work pieces from environmental influences and
  - wherein the transport chamber contains a horizontal batch loading and unloading device.
2. (Amended) The arrangement in accordance with claim 1, further comprising a vacuum pump for evacuating the air from the transport chamber.
3. (Amended) The arrangement in accordance with claim 1, wherein the transport chamber may be heated.
4. (Amended) The arrangement in accordance with claim 1, wherein the transport chamber is equipped with a removable thermal insulation made of steel.

5. (Amended) The arrangement in accordance with claim 1, wherein the transport chamber is equipped with a hermetically sealable loading door, which may be actuated via a drive mechanism.

6. (Amended) The arrangement in accordance with claim 5, wherein the transport chamber is equipped with a hermetically sealable connecting door.

7. (Amended) The arrangement in accordance with claim 1, wherein the transport chamber and the transporting gear can be moved relative to one another.

8. (Amended) The arrangement in accordance with claim 7, wherein the transport chamber is positioned on the transporting gear such that it can pivot horizontally or can move in a straight line in a horizontal and/or vertical direction.

9. (Amended) The arrangement in accordance with claim 1, wherein the transporting gear can rotate in place.

10. (Amended) The arrangement in accordance with claim 1, wherein the transporting gear is rail-mounted, or can be controlled freely via induction loops embedded in the base.

11. (Amended) A system for heat treating metallic work pieces comprising:

at least two treatment chambers for the horizontal acceptance of batches, in which the work pieces can be heat treated; and

an arrangement for transporting metallic work pieces can be coupled to the treatment chamber via a transfer canal that can be evacuated of air.

12. (Marked up/Amended) The system in accordance with claim 11, wherein the transfer canal is connected to the treatment chamber in a stationary position.

13. (Marked up/Amended) The system in accordance with claim 11, wherein the transfer canal can be evacuated separately.

14. (Marked up/Amended) The system in accordance with claim 11, wherein the transfer canal is equipped with a drive mechanism, via which a loading door of the transport chamber may be actuated.

15. (Marked up/Amended) The system in accordance with claim 11, wherein the treatment chamber is a vacuum furnace, an atmospheric furnace, or a cooling chamber.

16. (Marked up/Amended) A method of transporting metallic work pieces during a heat treatment process, in which the work pieces are transported within a heat-insulated, horizontally movable transport chamber, between at least two horizontally loaded treatment chambers, in which the work pieces may be heat treated, the method comprising:

evacuating the transport chamber, which is designed to be vacuum-tight, of air;

creating a vacuum that will protect the work pieces from environmental influences;

transporting the work pieces within the vacuum from one treatment chamber to the next; and

holding the work pieces at the treatment temperature, without any significant drop in temperature.

17. (Marked up/Amended) The method in accordance with claim 16, further comprising coupling the transport chamber via a transfer canal to the appropriate treatment chamber.

18. (Marked up/Amended) The method in accordance with claim 17, further comprising evacuating the transfer canal separately.

IN THE ABSTRACT:

Please amend the abstract in “clean” format, as follows:

An arrangement for transporting metallic work pieces includes a heat-insulated transport chamber, means for loading and unloading the work pieces, and transporting gear. To enable the flexible and efficient transport of the work pieces among a number of treatment chambers in an arrangement of this type during a heat treatment process, the transport chamber is designed to be vacuum-tight, such that it can be evacuated of air to create a vacuum that will protect the work pieces from environmental influences.

In addition, a system for heat treating metallic work pieces, comprising at least two treatment chambers in which the work pieces can be heat treated, is characterized in that an arrangement of this type can be coupled to the treatment chamber via a transfer canal that can be evacuated.

Furthermore, in a method for transporting metallic work pieces during a heat treatment process, a vacuum-tight transport chamber is evacuated to create a vacuum that will protect the work pieces from environmental influences, for the purpose of transporting the work pieces within this vacuum from one treatment chamber to the next.

REMARKS

Applicants request entry of the present amendments that conform the claims to U.S. practice. No new matter is being introduced by this Amendment as antecedent support is set forth in the original specification and in the original claims. Attached hereto is a marked-up version of the changes made. The attached page is captioned **"Version with Markings to Show Changes Made."**

Prosecution on the merits is respectfully requested.

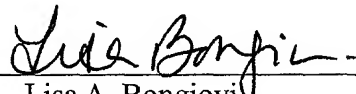
The Examiner is invited to contact Applicant's Attorneys at the below-listed telephone number regarding this Preliminary Amendment or otherwise regarding the present application.

If there are any charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicants' attorneys.

Respectfully submitted,

JORG MULLER-ZILLER, ET AL.

CANTOR COLBURN LLP  
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## MARKED UP VERSION TO SHOW CHANGES MADE

### IN THE CLAIMS:

A marked-up version of the Claims is as follows:

1. (Marked up/Amended) An arrangement for transporting metallic work pieces-(20), especially during a heat treatment process, comprising:

a heat-insulated transport chamber (10) to hold the work pieces-(20);

means (40) for loading and unloading the work pieces-(20); and

a transporting gear (30) for moving the transport chamber (10),

~~characterized in that~~ wherein the transport chamber (10) can be moved horizontally, is designed to be vacuum-tight, and can be evacuated of air to create a vacuum to protect the work pieces (20) from environmental influences; and

~~it also~~ wherein the transport chamber contains a horizontal batch loading and unloading device.

2. (Marked up/Amended) The arrangement in accordance with claim 1, ~~characterized by~~ further comprising a vacuum pump for evacuating the air from the transport chamber (10).

3. (Marked up/Amended) The arrangement in accordance with claim 1 ~~or~~ 2, ~~characterized in that~~ wherein the transport chamber (10) may be heated.

4. (Marked up/Amended) The arrangement in accordance with ~~one of~~ claims 1 through 3, ~~characterized in that~~ wherein the transport chamber (10) is equipped with a removable thermal insulation-(12), preferably made of steel.

5. (Marked up/Amended) The arrangement in accordance with ~~one of~~ claims 1 through 4, ~~characterized in that~~ wherein the transport chamber (10) is equipped with a hermetically sealable loading door-(15), which may be actuated via a drive mechanism-(16).

6. (Marked up/Amended) The arrangement in accordance with claim 5, characterized in that wherein the transport chamber (10) is equipped with a hermetically sealable connecting door.

7. (Marked up/Amended) The arrangement in accordance with ~~one of~~ claims 1 through 6, characterized in that wherein the transport chamber (10) and the transporting gear (30) can be moved relative to one another.

8. (Marked up/Amended) The arrangement in accordance with claim 7, characterized in that wherein the transport chamber (10) is positioned on the transporting gear (30) such that it can pivot horizontally or can move in a straight line in a horizontal and/or vertical direction.

9. (Marked up/Amended) The arrangement in accordance with ~~one of~~ claims 1 through 8, characterized in that wherein the transporting gear (30) can rotate in place.

10. (Marked up/Amended) The arrangement in accordance with ~~one of~~ claims 1 through 9, characterized in that wherein the transporting gear (30) is rail-mounted, or can be controlled freely via induction loops embedded in the base.

11. (Marked up/Amended) A system for heat treating metallic work pieces (20) comprising:

at least two treatment chambers (50) for the horizontal acceptance of batches, in which the work pieces (20) can be heat treated; and

an arrangement for transporting metallic work pieces characterized in that ~~an arrangement in accordance with one of claims 1 through 10~~ can be coupled to the treatment chamber (50) via a transfer canal (60) that can be evacuated of air.

12. (Marked up/Amended) The system in accordance with claim 11, characterized in that wherein the transfer canal (60) is connected to the treatment chamber (50) in a stationary position.



13. (Marked up/Amended) The system in accordance with claim 11 ~~or 12~~, characterized in that wherein the transfer canal (60) can be evacuated separately.

14. (Marked up/Amended) The system in accordance with ~~one of the~~ claims 11 through 13, characterized in that wherein the transfer canal (60) is equipped with a drive mechanism, via which ~~the~~ a loading door (15) of the transport chamber (10) may be actuated.

15. (Marked up/Amended) The system in accordance with ~~one of the~~ claims 11 through 14, characterized in that wherein the treatment chamber (50) is a vacuum furnace, an atmospheric furnace, or a cooling chamber.

16. (Marked up/Amended) A method of transporting metallic work pieces (20) during a heat treatment process, in which the work pieces (20) are transported within a heat-insulated, horizontally movable transport chamber (10), between at least two horizontally loaded treatment chambers (50), in which the work pieces (20) may be heat treated, ~~characterized in that~~ the method comprising:

evacuating the transport chamber (10), which is designed to be vacuum-tight, is evacuated of air;

creating a vacuum that will protect the work pieces (20) from environmental influences; ~~and in that~~

transporting the work pieces (20) ~~are transported within this the~~ vacuum from one treatment chamber (50) to the next; ~~and in this are held~~

holding the work pieces at the treatment temperature, without any significant drop in temperature.

17. (Marked up/Amended) The method in accordance with claim 16, characterized in that further comprising coupling the transport chamber (10) ~~is coupled~~ via a transfer canal (60) to the appropriate treatment chamber (50).

18. (Marked up/Amended) The method in accordance with claim 17, characterized in that further comprising evacuating the transfer canal (60) is evacuated separately.

IN THE ABSTRACT:

A “marked up” version of the Abstract is as follows:

An arrangement for transporting metallic work pieces (20) ~~comprises~~ includes a heat-insulated transport chamber (10), means (40) for loading and unloading the work pieces (20), and transporting gear (30). To enable the flexible and efficient transport of the work pieces among a number of treatment chambers in an arrangement of this type during a heat treatment process, the transport chamber (10) is designed to be vacuum-tight, such that it can be evacuated of air to create a vacuum that will protect the work pieces (20) from environmental influences.

In addition, a system for heat treating metallic work pieces (20), comprising at least two treatment chambers (50) in which the work pieces (20) can be heat treated, is characterized in that an arrangement of this type can be coupled to the treatment chamber (50) via a transfer canal (60) that can be evacuated.

Furthermore, in a method for transporting metallic work pieces (20) during a heat treatment process, a vacuum-tight transport chamber (10) is evacuated to create a vacuum that will protect the work pieces (20) from environmental influences, for the purpose of transporting the work pieces (20) within this vacuum from one treatment chamber (50) to the next.